What is claimed is:

1. A dielectric material composition with high dielectric constant and low dielectric loss, comprising a metal oxide having a formula of:

$Ba_{1-x}M^1_xTi_{1-y}M^2_yO_m$,

wherein

M^1 is a metal selected from the group consisting of the elements of Group IA and IIA of the period table, lanthanide series, Zn, Bi, and Sn;

M^2 is a metal selected from the group consisting of Ta, Zr, Ce, Nb, Co, and Hf;

x is a number of 0 to 1;

y is a number of 0 to 1; and

m satisfies the principle of electrical neutrality for the metal oxide.

2. The composition as claimed in claim 1, wherein M^1 is Mg, La, or Sr.

3. The composition as claimed in claim 2, wherein M^1 is Sr or La.

4. The composition as claimed in claim 1, wherein M^2 is Ta, Zr, or Hf.

5. The composition as claimed in claim 4, wherein M^2 is Ta.

6. The composition as claimed in claim 4, wherein M^2 is Zr.

7. The composition as claimed in claim 4, wherein M^2 is Hf.

8. The composition as claimed in claim 1, wherein x is a number of 0 to 0.5.

9. The composition as claimed in claim 1, wherein y is a number of 0 to 0.5.

10. The composition as claimed in claim 1, wherein the metal oxide is $(Ba_{1-x}Sr_x)(Ti_{1-y}Ta_y)O_3$, $0.3 \leq x \leq 0.5$, and $0 \leq y \leq 0.3$.

11. The composition as claimed in claim 1, wherein the metal oxide is $(Ba_{1-x}La_x)(Ti_{1-y}Hf_y)O_3$, $0 \leq x \leq 0.5$, and $0 \leq y \leq 0.5$.

12. The composition as claimed in claim 1, wherein the metal oxide is $(Ba_{1-x}La_x)(Ti_{1-y}Zr_y)O_3$, $0 \leq x \leq 0.5$, and $0 \leq y \leq 0.5$.

13. The composition as claimed in claim 1, wherein the dielectric material composition with high dielectric constant and low dielectric loss is manufactured from a method of solid state reaction.

14. The composition as claimed in claim 1, wherein the dielectric material composition with high dielectric constant and low dielectric loss is manufactured from a method of liquid phase reaction.

15. The composition as claimed in claim 1, wherein the dielectric material composition with high dielectric constant and low dielectric loss is in a bulk form.

16. The composition as claimed in claim 1, wherein the dielectric material composition with high dielectric constant and low dielectric loss is in a film form.

17. The composition as claimed in claim 1, wherein the dielectric constant of the dielectric material composition is more than 320 and the dielectric loss is less than 0.01.

18. The composition as claimed in claim 17, wherein the dielectric constant of the dielectric material composition is more than 950 and the dielectric loss is less than 0.001.